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ABSTRACT

The purpose of this study was to provide evidence for adapting and generalizing the use of the Children's Academic Motivation Inventory (CAMI) to high school students. The instrument was originally developed to provide a reliable, valid, theory-based measure of academic achievement motivation; it was suitable for use with children aged 12-14 years; and it could be applied across academic subjects. An adapted version of the CAMI was administered to 763 high school students living in south-central Kentucky. Additionally, cumulative high school grade point average (GPA) and the GPA for the semester in which the CAMI was administered were obtained for each participant. Results indicate positive correlations between the CAMI scores and students' cumulative and semester GPAs. A coefficient alpha of 0.92 provided evidence of the CAMI's internal consistency. Factor analysis produced a 12-factor solution similar to that of an earlier validation study. Overall, the findings indicate that the premises of the original CAMI generalize to a high school population. The CAMI holds promise for research purposes and for the identification of students who may benefit from intervention strategies aimed at increasing their academic achievement motivation. (TJH)

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The Children's Academic Motivation Inventory: Validation Evidence for Generalization to a High School Population

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Running head: CHILDREN'S ACADEMIC MOTIVATION INVENTORY

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Abstract

The purpose of this study was to provide evidence for adapting and generalizing the use of the Children's Academic Motivation Inventory (CAMI) to high school students. An adapted version of the CAMI was administered to 763 high school students. Additionally, cumulative high school grade point average and the grade point average for the semester in which the CAMI was administered were obtained for each participant. Results indicated positive correlations between the CAMI scores and students' cumulative and semester grade point averages (r = .35 and .35, respectively). A coefficient alpha of .92 provided evidence of the CAMI's internal consistency. Factor analysis produced a 12 factor solution similar to that of an earlier validation study. In sum, results indicate that the premises of the original CAMI generalize to a high school population.

The Children's Academic Motivation Inventory: Validation Evidence for Generalization to a High School Population

The Children's Academic Motivation Inventory (CAMI) was originally developed to provide a reliable, valid, theory-based measure of academic achievement motivation (AAM) suitable for use with children aged 12 to 14 (Hughes, Redfield, & Martray, in press). This age group was targeted because children within this age range may be especially vulnerable to the development of maladaptive motivational processes (Stipek, 1984). As a result of this vulnerability, children within this age range are especially in need of help from parents, teachers, school counselors, and significant others to develop adaptive and rational motivational processes. Hence, appropriate measures of AAM should help identify children at risk of maladaptive motivational development and guide the selection of desirable long-term interventions.

The CAMI was designed to provide a general measure of AAM that could be applied across academic subjects. Several assumptions regarding the motivation to achieve in academic settings were used as the bases for the CAMI. First, it was assumed that motivation and cognition are related (Ames & Ames, 1984; Resnick, 1987). Second, it was assumed that AAM represents a blend of personal and social cognition (Ames, 1984; Covington, 1984; Nicholls, 1984). Third, it was assumed that AAM is a multifaceted construct, comprised of several underlying cognitive processes (Ames & Ames, 1984; Frymier, 1970; Moen & Doyle, 1977). Fourth, it was assumed that AAM is learned and, therefore, can be modified (de Charms, 1984; Resnick, 1987; Stipek, 1984). Finally, it was assumed that AAM is fairly stable across time. Therefore, it is predicted that AAM cannot be modified in a short period of time (Stipek, 1984).

Because the relationship between AAM and classroom achievement is considered to become fairly stable after about age eight or nine (Stipek, 1984), it seemed reasonable to expect that the original CAMI, developed for use with 12- to 14-year-olds, could be adapted and generalized to high school students. The rationale for adapting and generalizing the use of the CAMI to high school students was based on (a) the fact that the academic achievement level of American high school students, compared to students in other countries, is a national concern and (b) the notion that AAM and academic performance are positively related. Without appropriate diagnosis and intervention, academic failure experiences are likely to continue throughout high school. The consequences of repeated academic failures culminate in high school as the gap between ability and performance increases. While many factors other than AAM may influence academic achievement, AAM is one problem which can be remediated through intervention.

In order to intervene appropriately, accurate diagnostic instrumentation is required. Because the CAMI has been demonstrated to validly measure AAM among 12- to 14-year-olds, it seemed reasonable to hypothesize that it could be adapted for valid use with high school age students.

The purpose of this study was to replicate the findings of the original validation study, thus providing evidence that an adapted version of the CAMI could be validly used among high school students. Three research questions were posed to address the generalization of an adapted version of the CAMI to a group of high school students. First, is the CAMI internally consistent? Second, do CAMI scores correlate positively and significantly with cumulative and current semester high school grade point

averages? Third, is the factor structure of the CAMI for the high school population consistent with that obtained using a population of 12- to 14-year-olds?

Method

Participants

Participants were 763 ninth-, tenth-, eleventh-, and twelfth-grade students (n = 198, n = 204, n = 186, and n = 175, respectively) representing the entire student body attending a high school in southcentral Kentucky. The participants included 407 (53.3%) males and 356 (46.7%) females. Eighty-six percent of the participants were white, 12% were black, and 2% were of ethnic origin other than white or black.

Instrumentation

In the present study, measures consisted of the CAMI and cumulative and current semester high school grade point averages.

Children's Academic Motivation Inventory. In a previous study, Hughes et al. (in press) investigated the psychometric properties of the CAMI for use with 12- to 14-year-olds. Items were written to reflect the individual dispositions toward learning that may be characteristic of cognitive theories of motivation (Ames & Ames, 1984; Resnick, 1987). Examples of these dispositions include: (a) orientation toward academic success (Moen & Doyle, 1977; Weiner, 1980, 1986); (b) value attached to education (Moen & Doyle, 1977); (c) need to avoid failure (Weiner, 1980); (d) academic self-concept (Dolan, 1983); and (e) self-efficacy (Ashton & Webb, 1986). Both the original and adapted versions of the CAMI consist of 60 items; item response options assume a six-point Likert-type format. Scale anchors were strongly agree, agree, slightly agree, slightly disagree, disagree, and strongly disagree.

Coefficient alpha of the original CAMI was .92. The convergent validity index, with repect to the Junior Index of Motivation Scale (Frymier, 1970), was .37 and the discriminant validity index, with regard to the Children's Social Desirability Scale (Crandall, Crandall, & Katkovsky, 1965), was .22. The zero-order correlations between CAMI scores and total reading scores on the Kentucky Essential Skills Test (KEST), total math scores on the KEST, and teacher-assigned math grades were .25 ($p < .001$), .12 ($p < .05$), and .22 ($p < .001$), respectively. Principal component factor analysis with varimax rotation (SAS, Inc., 1985b), based on Cattell's scree test, extracted 12 factors. The names assigned to the twelve factors, or "dispositions toward learning," were (a) perceived value of school success, (b) persistence, (c) academic inadequacy, (d) academic adequacy/efficacy, (e) instructional variety, (f) affiliation, (g) social variety, (h) goal oriented (i) fear of success, (j) attitude toward school, (k) effort, and (l) academic confidence. The psychometric properties of the original CAMI were also found to generalize to a group of college students (Hughes, Cecil, Redfield, & Martray, 1987).

High School Grade Point Averages. Cumulative high school grade point average (GPA) and the GPA for the semester in which the CAMI was administered were also obtained for each participant.

Procedure

For the purposes of the present study, the CAMI was revised and then administered to all participants. Eleven of the 60 original CAMI items, containing the word "not", were rewritten because of the ambiguity presented by negatively stated items (Cronbach, 1984). For example, the item "I do not like to be interrupted while I am working" was changed to "I like to be left alone while I am working."

Results and Discussion

The first issue addressed by this study was the internal consistency of the CAMI items. Coefficient alpha (SPSS, Inc., 1983) for the total CAMI scores was .92, compared to .92 for the original CAMI.

The second research issue concerned the correlation of CAMI scores with cumulative and semester GPAs. Pearson product-moment correlation coefficients (SAS, Inc., 1985a) between the CAMI scores and the students' cumulative GPAs and semester GPAs were .35 and .35 ($p < .001$), respectively. The correlation between cumulative and semester GPAs was .93 ($p < .001$). The high correlation between cumulative and semester GPAs indicates that high school GPA is fairly stable. The relationship between CAMI scores and GPA also appears to be stable. Table 1 presents the descriptive statistics and Table 2 presents the bivariate correlation matrix for CAMI scores and cumulative and semester GPAs.

Insert Tables 1 and 2 about here

The third research issue was whether the factor structure of the high school version of the CAMI was consistent with that yielded by the earlier study of 12- to 14-year-olds (Hughes et al., in press). Principal component factor analysis with varimax rotation (SAS, Inc., 1985b) produced a 12 factor solution that was similar to that of the earlier study. The prerotation eigenvalue of the twelfth factor was 1.18. Table 3 presents the names of the factors, and lists the items loading on each factor, along with their respective item-factor structure coefficients. A list of items loading on each factor for the original version (12- to 14-year-old students) compared to the adapted version (high school students) of the

CAMI appears in Table 4.

Insert Tables 3 and 4 about here

Conclusions

The high internal consistency of the CAMI (r = .92), positive correlations (r = .35 and .35) between the CAMI scores and students' cumulative and semester GPAs, respectively, and the factor structure indicate that the premises of the original CAMI generalize to a high school population. The moderate and positive correlations between CAMI scores and cumulative and semester GPAs support the hypothesis that the CAMI is moderately related to academic achievement. The fact that CAMI scores were similarly correlated to cumulative and semester GPAs, may support the idea that AAM is relatively stable over time (Stipek, 1984). The 12 factor solution obtained in the present study was similar to that reported in a previous study (Hughes et al., in press).

A question that arises as a result of this study is: Which version of the CAMI should be used with junior high school students? It is recommended that the adapted version be used with all students for two reasons. First, the replication of the internal consistency and factor structure in the present study may indicate that the two versions are similar. Second, the revisions in the present version of the CAMI involved rewriting items so that the word "not" was removed, making the items less ambiguous to students (Cronbach, 1984).

In sum, the results of this investigation provide evidence for the generalization of the CAMI. These results, along with those of previous studies (Hughes, et al., 1987; Hughes, et al., in press) suggest that the

CAMI holds promise for research purposes and for the identification of students who may benefit from intervention strategies aimed at increasing AAM.

References

Ames, C. (1984). Competitive, cooperative, and individualistic goal structures: A cognitive-motivational analysis. In R. Ames & C. Ames (Eds.), Research on motivation in education: Vol. 1. Student motivation (pp. 177-208). Orlando, FL: Academic Press.

Ames, R., & Ames, C. (Eds.). (1984). Research on motivation in education: Vol. 1. Student motivation. Orlando, FL: Academic Press.

Ashton, P. T., & Webb, R. B. (1986). Making a difference: Teachers' sense of efficacy and student achievement. New York: Longman.

Covington, M. V. (1984). The motive for self-worth. In R. Ames & C. Ames, (Eds.), Research on motivation in education: Vol. 1. Student motivation (pp. 77-113). Orlando, FL: Academic Pres.

Crandall, V. C., Crandall, V. J., & Katkovsky, W. (1965). A children's social desirability questionnaire. Journal of Consulting Psychology, 29(1), 27-36.

Cronbach, L. J. (1984). Essentials of psychological testing (4th ed.). New York: Harper and Row.

de Charms, R. (1984). Motivation enhancement in educational settings. In R. Ames & C. Ames, (Eds.), Research on motivation in education: Vol. 1. Student motivation (pp. 275-310). Orlando, FL: Academic Press.

Dolan, L. J. (1983). Validity analyses for the school attitude measures at three grade levels. Educational and Psychological Measurement, 43 295-303.

Frymier, J. R. (1970). Development and validation of a motivation index. Theory Into Practice, 9, 56-81.

Hughes, K. R., Cecil, C. E., Redfield, D. L., & Martray, C. R. (1987). The children's academic motivation inventory: Validation evidence for generalization to a college population. Paper presented at the annual meeting of the Mid-South Educational Research Association, Mobile, AL.

Hughes, K. R., Redfield, D. L., & Martray, C. R. (in press). The children's academic motivation inventory: Research notes on the psychometric properties. Measurement and Evaluation in Counseling and Development.

McClelland, D. C. (1985). Human Motivation. Glenview, IL: Scott, Foresman.

Moen, R., & Doyle, K. O. (1977). Construction and development of the Academic Motivations Inventory (AMI). Educational and Psychological Measurement, 37, 509-512.

Nicholls, J. G. (1984). Conceptions of ability and achievement motivation. In R. Ames & C. Ames (Eds.), Research on motivation in education: Vol. 1. Student motivation (pp. 39-73). Orlando, FL: Academic Press.

Resnick, L. B. (1987). Education and learning to think. Washington, DC: National Academy Press.

SAS, Inc. (1985a). SAS user's guide: Basics. Cary, NC: SAS Institute.

SAS, Inc. (1985b). SAS user's guide: Statistics. Cary, NC: SAS Institute.

SPSS, Inc. (1983). Statistical package for the social sciences[X] user's guide. New York: McGraw-Hill.

Stipek, D. J. (1984). The development of achievement motivation. In R. Ames & C. Ames (Eds.), Research on motivation in education: Vol. 1. Student motivation (pp. 145-174). Orlando, FL: Academic Press.

Weiner, B. (1980). Human motivation. New York: Holt, Rinehart and Winston.

Weiner, B. (1986). An attributional theory of motivation and emotion. New York: Springer-Verlag.

Table 1

Means and Standard Deviations for CAMI Scores and Cumulative and Semester GPAs

Variable	Mean	SD
CAMI	284.75	26.2
Cumulative GPA	2.74	0.96
Semester GPA	2.85	1.03

Table 2

Pearson Product-Moment Correlations Among CAMI Scores, Cumulative GPAs, and Semester GPAs

Variable	CAMI	Cumulative GPA
CAMI	—	
Cumulative GPA	.35	—
Semester GPA	.35	.93

Table 3

Names Assigned each Factor, Selected Items Loading on each Factor, and Structure Coefficients

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I. Persistence:

2. I finish most jobs or assignments that I begin. (.63)
6. I work hard on most school assignments. (.69)
11. I usually complete an assignment before starting on others. (.63)

II. Perceived Value of School Success:

20. School is important to my future. (.68)
31. Doing well in school is important in life. (.74)
37. What I learn in school will be useful for the rest of my life. (.62)

III. Instructional Variety:

17. I like it when teachers have us do new and different things in class. (.69)
35. I like for my daily school activities to be the same each day. (-.63)
54. School would be more fun if we got to try new things. (.44)

IV. Affiliation:

22. My best friends think that school is important for success in life. (.64)
53. My best friends study hard in school. (.83)
57. My best friends do well in school. (.78)

V. Goal Oriented:

7. I set goals for myself. (.76)
12. I work toward goals. (.69)

VI. Social Variety:

42. I make as many friends as possible. (.49)
59. Good friends are important for success in life. (.56)

VII. Effort:

9. When I do well on a test it is usually because I studied hard. (.45)
45. I make high grades when I try harder. (.66)

VIII. Attitude Toward School:

47. I get tired of doing the same things in school day after day. (.59)
49. Almost all of my classes are boring. (.66)

IX. Academic Inadequacy:

4. When I do well on a test it is usually because I was lucky. (.42)
16. When I do well on a school assignment it is usually because the assignment was easy. (.45)
26. When I do well on a test it is usually because the teacher felt sorry for me and gave me the grade. (.65)

X. Academic Adequacy:

1. When I try hard I am usually successful. (.42)
5. I have the ability to do well in school. (.57)
21. When I do well on a test it is usually because I have the ability to do well. (.65)

XI. Efficacy:

38. When it comes right down to it, students have the most to do with whether they are successful in school. (.58)
50. The person who has the most control over what grades I make is me. (.62)

XII. Aspiration for Success:

19. I like being successful at things I do. (.61)
24. I hope to be important when I grow up. (.69)
28. I like to be recognized at being good at something. (.62)

Table 4

Items Loading on each Factor for the Original and Adapted Versions of the CAMI and Structure Coefficients

Item	Original CAMI	Adapted CAMI
1	Academic Adequacy/Efficacy (.48)	Academic Adequacy (.42)
2	Persistence (.59)	Persistence (.63)
3	Persistence (.52)	Persistence (.54)
4	Academic Inadequacy (.53)	Academic Inadequacy (.42)
5	Academic Adequacy/Efficacy (.63)	Academic Adequacy (.57)
6	Persistence (.64)	Persistence (.69)
7	Goal Oriented (.77)	Goal Oriented (.76)
8	Persistence (.56)	Academic Adequacy (.51)
9	Academic Confidence (-.42)	Effort (.45)
10	Academic Adequacy/Efficacy (.53)	Academic Adequacy (.41)
11	Persistence (.62)	Persisence (.63)
12	Goal Oriented (.75)	Goal Oriented (.69)
13	Academic Adequacy/Efficacy (.50)	Aspiration for Success (.57)
14*	Fear of Success (.65)	Academic Inadequacy (.46)
15*	Attitude Toward Success (.54)	Perceived Value of School Success (.41)
16	Academic Inadequacy (.49)	Academic Adequacy (.45)
17	Instructional Variety (.68)	Instructional Variety (.69)
18	Academic Confidence (.43)	Persistence (.50)
19	Perceived Value of School Success (.43)	Aspiration for Success (.61)
20	Perceived Value of School Success (.70)	Perceived Value of School Success (.68)
21*	Academic Inadequacy (.66)	Academic Adequacy (.65)
22	Affiliation (.60)	Affiliation (.64)
23	Fear of Success (-.37)	Aspiration for Success (.58)
24	Perceived Value of School Success (.32)	Aspiration for Success (.69)
25*	Fear of Success (.61)	Persistence (.66)
26	Academic Inadequacy (.40)	Academic Inadequacy (.65)
27	Perceived Value of School Success (.58)	Aspiration for Success (.66)
28*	Academic Adequacy/Efficacy (.47)	Aspiration for Success (.62)
29*	Effort (.60)	Persistence (.63)
30	Persistence (.49)	Persistence (.54)

31	Perceived Value of School Success (.76)	Perceived Value of School Success (.74)
32	Academic Confidence (.48)	Academic Adequacy (.58)
33	Perceived Value of School Success (.64)	Aspiration for Success (.58)
34	Persistence (.66)	Persistence (.70)
35	Instructional Variety (-.57)	Instructional Variety (-.63)
36*	Effort (.54)	Persistence (.43)
37	Perceived Value of School Success (.57)	Perceived Value of School Success (.62)
38*	Goal Oriented (-.35)	Efficacy (.58)
39	Academic Adequacy/Efficacy (.48)	Academic Adequacy (.64)
40	Perceived Value of School Success (.62)	Perceived Value of School Success (.67)
41	Instructional Variety (-.61)	Instructional Variety (-.58)
42	Social Variety (.42)	Social Variety (.49)
43	Perceived Value of School Success (.78)	Perceived Value of School Success (.76)
44*	Academic Inadequacy (.67)	Academic Adequacy (.65)
45*	Academic Inadequacy (.64)	Effort (.66)
46	Persistence (.53)	Persistence (.61)
47*	Attitude Toward School (.59)	Attitude Toward School (.59)
48*	Perceived Value of School Success (.41)	Effort (.51)
49	Attitude Toward School (.62)	Attitude Toward School (.66)
50	Effort (.45)	Efficacy (.62)
51*	Academic Confidence (-.31)	Academic Inadequacy (.35)
52	Social Variety (.71)	Social Variety (.58)
53	Affiliation (.70)	Affiliation (.83)
54*	Instructional Variety (.55)	Instructional Variety (.44)
55*	Effort (.27)	Social Variety (.42)
56	Social Variety (.35)	Effort (.59)
57	Affiliation (.73)	Affiliation (.78)
58	Social Variety (-.66)	Academic Inadequacy (.56)
59	Affiliation (.54)	Social Variety (.56)
60	Instructional Variety (.58)	Social Variety (.50)

*Item was modified for the adapted version of the CAMI.